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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

ZERVIGON, RUDY

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 03/31/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/039,357

Applicant(s)

PARK ET AL.

Examiner

Rudy Zervigon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 November 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 17-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 November 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-16, drawn to an apparatus (Figure 1; column 4, lines 19-48) for forming a thin film (column 2, lines 14-36), classified in class 118, subclass 715.
 - II. Claims 17-20, drawn to a method of forming a thin film (column 2, lines 14-36), classified in class 427, subclass 255.394.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as process and apparatus (Figure 1; column 4, lines 19-48) for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus (Figure 1; column 4, lines 19-48) or by hand, or (2) the apparatus (Figure 1; column 4, lines 19-48) as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the apparatus (Figure 1; column 4, lines 19-48) as claimed can be used to practice another and materially different process, for example, a thin film (column 2, lines 14-36) forming process not requiring the reaction of the chemical source gasses as claimed in method claim 17.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
4. During a telephone conversation with Coney Henry for Tim Keefer on March 10, 2003 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-16. Affirmation of this election must be made by applicant in replying to this Office action.

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Claims 17-20 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Drawings

6. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "140" has been used to designate both "substrate inlet/outlet" ([0039]) and "distributor" ([0040]). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

7. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "150" and "140" have both been used to designate "substrate inlet/outlet". A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

8. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "power source" must be shown or the feature canceled from the claim. No new matter should be entered.

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A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

9. The disclosure is objected to because of the following informalities: "AMD" should be "ALD" in [0055], "substrata" should be "substrate (17, Figure 1)" in [0039].

Appropriate correction is required.

Claim Rejections - 35 USC § 112

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

11. Claims 1-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The "beating member" of claim 1 is interpreted as "heating member (16; Figure 1; column 4, lines 60-68)". Correction is required.

12. Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 3 requires "a first portion having a cylindrical". It is assumed that the first portion is a cylindrical portion. Correction is required.

13. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the

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invention. Claim 6 requires "rater" as detailed by the publication of this application. It is assumed Applicant means "rather". Correction is required.

14. Claim 8 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 8 requires "in de top" as detailed by the publication of this application. It is assumed Applicant means "in the top". Correction is required.

15. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

16. Claim 6 recites the limitations "large diameter" and "small diameter". There is insufficient antecedent basis for these limitations in the claim.

Claim Rejections - 35 USC § 102

17. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

18. Claims 1-3, 7, and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Fuki et al (USPat. 5,002,928). Fuki teaches an apparatus (Figure 1; column 4, lines 19-48) for forming a thin film (column 2, lines 14-36), comprising:

- i. 1. a reaction chamber (14; column 5, lines 1-2) having a top portion, a sidewall portion and a bottom portion; a gas injector (1, 12; column 4, lines 60-69) penetrating the top portion and letting a source element pass therethrough; a distributor (7, Figure 1; column 4, lines 19-

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- 48) connected to the gas injector (1, 12; column 4, lines 60-69), wherein a plurality of injection holes (see material conduits 9, 11, and 12; Figure 1) are formed in the distributor (7, Figure 1; column 4, lines 19-48) and the source element is injected through the plurality of injection holes (see material conduits 9, 11, and 12; Figure 1); and a substrate (17, Figure 1) heating member (16; Figure 1; column 4, lines 60-68) positioned in a reaction space (container 14) defined by the top, bottom and sidewall portions of the reaction chamber (14; column 5, lines 1-2), and arranged below the distributor (7, Figure 1; column 4, lines 19-48)
- ii. 2. a ram (15, Figure 1; column 4, lines 60-69) that is mounted through the bottom portion of the reaction chamber (14; column 5, lines 1-2) to support the substrate (17, Figure 1) heating member (16; Figure 1; column 4, lines 60-68)
- iii. 3. the distributor (7, Figure 1; column 4, lines 19-48) includes a first portion (cylindrical portion of 7) having a cylindrical portion and a second portion (truncated cone portion of item 7) shaped like a truncated cone.
- iv. 7. the substrate (17, Figure 1) heating member (16; Figure 1; column 4, lines 60-68) is positioned at the center (Figure 1) of the reaction space (container 14) and the gas injector (1, 12; column 4, lines 60-69) is disposed at the center of the top portion of the reaction chamber (14; column 5, lines 1-2)
- v. 15. the top portion of the reaction chamber (14; column 5, lines 1-2; Figure 1) has a dome shape

Claim Rejections - 35 USC § 103

19. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

20. Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fuki et al (USPat. 5,002,928) in view of Voll et al (USPat. 4,439,401). Fuki is discussed above. Fuki does not teach injection holes that are arranged at the side of the second portion of the distributor as discussed above.

Voll teaches numerous gas distributors (Figures 1-10) including a distributor (Figure 4) which has a first portion (cylindrical portion of item 4) having a cylindrical portion and a second portion (truncated cone portion of item 4) shaped like a truncated cone with injection holes (3) that are arranged at the side of the second portion of the distributor.

Voll's gas distributor (Figure 4) further includes:

- i. 5. wherein each injection hole (3) includes a large diameter part (open cone portion of 2) and a small diameter part (drilled portion 3 into 4) providing a velocity of source element which increases
- ii. 6. wherein the large diameter part has a large diameter rather than the small diameter part

It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace Fuki's gas distributor with Voll's gas distributor.

Motivation for replacing Fuki's gas distributor with Voll's gas distributor is to provide an alternate means for distributing process gasses.

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21. Claims 8-14, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fuki et al (USPat. 5,002,928) in view of McMillin et al (USPat. 6,013,155). Fuki is discussed above. Fuki further teaches the injection of oxygen (air carrier gas; column 5, lines 19-25). However, Fuki does not teach plural distributors and a specific orientation of plural distributors. Further, Fuki does not teach that the size of his injection holes vary depending on his reaction space of his reaction chamber. Further, Fuki does not teach the substrate heating member includes both a heating element and an electric power source supply as one body. McMillin teaches a gas injection system (Title; Figure 10a) including plural distributors (180; Figure 10a) at specified orientations. Further, McMillin teaches the substrate heating member (130) which includes an electric power source supply (column 6, lines 10-15).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to:

- i. reproduce Fuki's gas distributor, at specified orientations, as taught by McMillin - Motivation to reproduce Fuki's gas distributor, at specified orientations, as taught by McMillin is for providing "uniform high flow rate delivery of reactant gases" as taught by McMillin (column 4, lines 2-10). Further, it is well established that the duplication of parts is obvious (In re Harza , 274 F.2d 669, 124 USPQ 378 (CCPA 1960) MPEP 2144.04).
- ii. vary the sizes for Fuki's injection holes - Motivation to vary the sizes for Fuki's injection holes is to provide a desired flow characteristic for the injected gases. Further, it is well established that changes in apparatus dimensions are within the level of ordinary skill in the art.(Gardner v. TEC Systems, Inc. , 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert.

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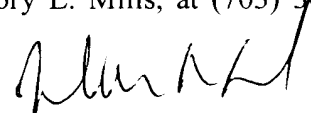
denied , 469 U.S. 830, 225 USPQ 232 (1984); In re Rose , 220 F.2d 459, 105 USPQ 237 (CCPA 1955); In re Rinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); See MPEP 2144.04)

- iii. add a power source to Fuki's heater as taught by McMillin providing both a heating element and an electric power source supply as one body - Motivation to add a power source to Fuki's heater as taught by McMillin providing both a heating element and an electric power source supply as one body is to control the heating of the substrate.

Conclusion

22. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. USPat. 5,547,714; 3,881,863; 4,313,721; 3,592,575; 3,592,575; 3,995,811; 4,080,927; 4,293,755; 4,481,228; 3,745,969; US 2002/0129768; US 2002/0088545; US 2002/0086106 A1

23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (703) 305-1351. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official after final fax phone number for the 1763 art unit is (703) 872-9311. The official before final fax phone number for the 1763 art unit is (703) 872-9310. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (703) 308-0661. If the examiner can not be reached please contact the examiner's supervisor, Gregory L. Mills, at (703) 308-1633.



JEFFRIE R. LUND
PRIMARY EXAMINER